

The National Animal Health Monitoring System: Addressing Animal Health Information Needs in the U.S.A.

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ABSTRACT

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The National Animal Health Monitoring System (NAHMS) was created to address the animal health information needs of producers, consumers, agribusiness, academia, and animal health regulatory officials in the U.S.A. The NAHMS program is designed to collect, analyze and disseminate information about the health and productivity of U.S. agriculture, and has evolved through a series of state pilot projects, each of which used slightly different methodologies in the search for optimal strategies for animal health monitoring. Today, the NAHMS program is in transition from state pilot projects to a national focus. A successful transition requires strategic planning to accommodate the changes which are occurring in U.S. agriculture.

In 1990, the NAHMS program will initiate a national survey of swine health, focusing on the period from farrowing to weaning. A total of 1400 herds will be involved. Interviews concerning management practices, facilities and herd health history will be complemented by prospective monitoring of sows and litters between farrowing and weaning. Up to 100 farrowings will be monitored in each herd over a 3-month period. The data generated by the NAHMS program will allow calculation of descriptive statistics on animal health and productivity and analyses of the farm-level characteristics as they relate to health, productivity, and economic efficiency.

INTRODUCTION

Agriculture in the U.S.A. is changing in response to both economic and political pressures. Forecasts of the U.S. economy over the next 5 years suggest only moderate growth in inflation-adjusted personal income (Caton, 1988). Consequently, given already mature food markets, total meat consumption is not expected to increase substantially (although consumer preferences show a trend from red meats to poultry and fish) (USDA Agricultural Statistics, Anon., 1987). The concern over the federal deficit and recent government appointments suggest a more market-oriented farm policy with a decrease in direct

government farm subsidies (USDA Agricultural Outlook, Anon., 1989). All of these trends provide an impetus for producers to adopt new production practices which decrease production and price risk and increase efficiencies and economic returns.

Whereas economic pressures encourage efficiency, political pressures focus on food quality and animal welfare/animal rights. Consumers – estranged from agricultural production techniques and increasingly sensitive to health concerns – are demanding higher food quality with less risk of unknown exposures (Beck et al., 1989). At the same time, public review of farm production practices will increase in recognition of the emerging political power of the animal welfare/animal rights movements.

These changes will hasten the trend toward disease prevention practices which emphasize productivity. Animal producers will demand more services from animal health professionals. The nature of these services will become increasingly complex, requiring the integration of data and information from many sources. The role of the veterinarian will continue to evolve from emergency response to individual illness or epidemic disease to that of an animal health consultant committed to the maintenance of optimal herd health and productivity (Pritchard, 1989). At the same time, the public and producers will require government programs for information management and dissemination. Given this expected information explosion, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is in an excellent position to assume the national role as broker of information on animal health.

NAHMS STRATEGIC PLANNING

In response to these trends, the NAHMS program must ensure that the needs and concerns of the potential users of NAHMS information are incorporated into the operational goals of the program. The potential users include producers and producer organizations, animal health agencies, veterinary practitioners, researchers, and agribusinesses. Furthermore, the ultimate beneficiaries include consumers of animal products who will benefit from the availability of affordable and high-quality animal products with less exposure to zoonotic diseases transmissible through food and fiber. The U.S. taxpayers also will benefit from more efficient use of the resources they provide to animal health agencies.

Identification of the users' needs becomes the function of the NAHMS Advisory Groups, which are composed of representatives from the various user groups of animal health information: producers, farm organizations, drug, biologic and feed industries, and state and federal animal health officials. An overall Advisory Group evaluates the NAHMS policy and development from a national perspective, and commodity-specific Advisory Groups focus on the needs

of a specific class of livestock such as beef cow-calf or feedlot sheep. These Advisory Groups convene to identify information needs that can be met by the NAHMS, to rank these needs in order of priority, and to clarify how the information will be used after it has been provided. Given the priorities identified by the Advisory Group, a Technical Council of subject experts help to evaluate alternative methodological and operational strategies. The specific recommendations of the Advisory Group and Technical Council provide the NAHMS staff with a foundation for the development of an operational approach.

NAHMS OBJECTIVES

Involvement of the potential users of NAHMS information in the development of operational plans is the critical element of the cycle of recurring objectives for the NAHMS (Fig. 1). The priorities of the users and the technical advice of subject experts will be used to develop methods for the collection and analysis of reliable animal health and productivity data so that useful information can be provided to the users in a timely manner. The evaluation component of the NAHMS objectives helps to ensure that potential improvements to the system are identified early and implemented promptly. Maintenance of a state-of-the-art information system and promotion of collaboration and teamwork within the agricultural community is an overall program objective.

Specific strategies for reaching these objectives have been formulated (NAHMS Strategic Plan, Anon., 1989). Statistically reliable animal health and productivity data require a sampling design and survey techniques which facilitate efficient collection of high-quality data. Proper design of data-collection methods ensures that epidemiological and economic analyses are feasible.

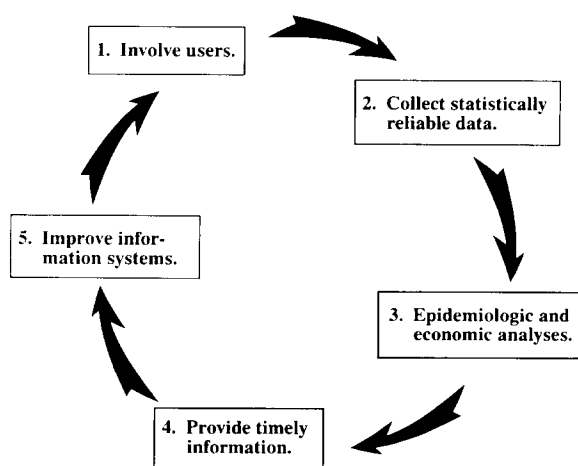


Fig. 1. NAHMS objectives.

Both short- and long-term prospective monitoring of herds and flocks will be incorporated into the data-collection scheme. Data collection includes interviews, questionnaires, and maintenance of health and productivity diaries by the participating producers. The solicitation of original animal health and productivity data will be supplemented by relevant data from existing public and private sources such as the Dairy Herd Improvement program, Diagnostic Laboratory databases, and on-farm computerized records systems.

The collection of biological specimens from animals and/or their environment is an integral component of the NAHMS data collection. Identification of subsampling priorities follows the same pattern as described for other information needs. Subsampling priorities recognize the following additional constraints: (1) the procedure should be simple, and safe for producers, veterinarians, and animals; (2) the procedure should be standardized for reliable and repeatable results; (3) the procedure should avoid regulatory constraints which might jeopardize confidentiality; (4) the procedure should not violate the biosecurity of the producers.

Analyses of the NAHMS data will provide descriptive statistics, identification of potential risk factors, and modeling of agent, host, and environmental interactions in health and productivity. Farm-level data will be extrapolated to regional and national estimates so that trends can be identified. Potential risk factors associated with disease and impaired productivity will be explored so that alternative disease prevention and control strategies can be evaluated. Management and environmental inputs will be characterized in terms of farm performance, profitability, and risk. Through the combination of descriptive statistics and risk factor identification, the NAHMS information will facilitate modeling for purposes such as risk assessments on animal and human health.

Timely dissemination of the information derived from the NAHMS has been a prerequisite of the users who support the program's development. The NAHMS program can respond to information needs of government agencies, agribusiness, academia, producers and consumers. By monitoring the information generated through both passive and active surveillance, these users can be alerted to emerging or unforeseen health or productivity issues. In addition, interpretation of the NAHMS information will suggest new avenues for further investigations which have the potential for substantial benefits.

The NAHMS program is designed for flexibility in meeting the information needs of its users. User satisfaction with the information provided by the NAHMS will provide an overall measure of the program's success. User response will dictate program enhancements and modifications. As new needs arise, innovative ideas will be sought to meet these needs. Opportunities for the integration of new animal health and productivity data sources in the NAHMS information network will be explored. In addition, the NAHMS program will nurture cooperation with the animal health research community to investigate and apply new methodologies for data collection and analysis.

Meeting the growing information needs of U.S. producers, consumers, and the other NAHMS users will require a flexible information system which ensures that data and information are accessible to multiple users. Data input, analysis, and retrieval must be compatible. Quality control will be necessary to guarantee accuracy, consistency, and completeness. Through provision of a credible and functional information system, the NAHMS program can cultivate long-term collaboration with other government agencies, academia, agribusiness, producers, and consumers in the sharing of information.

OPERATIONAL PLANS FOR NAHMS, 1990 AND BEYOND

The prospective health and productivity monitoring of the NAHMS incorporates a uniform national core which can be enhanced by state-level projects addressing specific regional concerns. In 1990, the national core of NAHMS will concentrate on swine health and productivity. Swine inventories, facilities, feeding regimens, management and health practices will be surveyed. Data on the economics of the operation will be solicited. Intensive prospective monitoring during the farrowing period will provide more complete descriptions of the morbidity and mortality of sows and baby pigs from birth to weaning. Collection of sera and water samples will comprise a voluntary subsampling component of the national program.

A sample of approximately 1400 swine operations in 18 states will be selected to represent U.S. swine operations. The sampled states include all of the original NAHMS pilot states (California, Colorado, Georgia, Iowa, Michigan, Ohio, and Tennessee) plus six states which are field testing NAHMS swine forms and procedures in 1989 (Alabama, Illinois, Maryland, Oregon, Wisconsin, and Virginia) and five new states selected to represent the remaining intensive hog-producing states (Indiana, Minnesota, Nebraska, North Carolina, and Pennsylvania). Within specific states, additional data or sample collection may augment the NAHMS core, focusing on regional concerns such as the "roaster" pig industry in California where 100-lb hogs are marketed for roasting whole.

While the national swine survey is under way, forms and procedures for surveying the nation's dairy cattle will be field tested in several states. Field testing helps to ensure that the data collection instruments are complete and administrable, and provides time estimates for their implementation. Surveys of additional animal groups (such as beef cattle or poultry) will be in the design stage, with Advisory Groups and Technical Councils meeting to provide input and direction for the NAHMS.

Complementing the active surveillance activities of the national swine survey will be passive surveillance efforts in the compilation and dissemination of diagnostic laboratory results. Beginning with several specific diseases [such as equine infectious anemia and salmonellosis in swine and poultry], results from laboratories across the nation will be collected, arranged in similar for-

mats, and provided to interested users. In addition, animal health and productivity data from other agencies and organizations will be solicited for the evolving NAHMS database.

SUMMARY

The NAHMS program is evolving to meet the expressed animal health information needs in the U.S.A. The NAHMS mission is to protect and improve animal and human health, ensure quality and abundance of food and fiber, and keep U.S. agriculture competitive by collecting, analyzing, and providing users with information on the epidemiology and economics of animal health and production.

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